St Helena's Church of England Primary School

Computing Progression Framework

The curriculum objectives have been split into phases to ensure coverage. From Year 1, our children should be introduced to modern technology, its benefits and practical opportunities inside and outside school. This foundation will set children up for success in KS2 and their further educational carers. In EYFS the children may use technology as an invisible tool to support the three characteristics of effective teaching and learning

- playing and exploring - children investigate and experience things, and 'have a go'
- active learning - children concentrate and keep on trying if they encounter difficulties, and enjoy achievements
- creating and thinking critically - children have and develop their own ideas, make links between ideas, and develop strategies for doing things

Purpose of study

A high-quality computing education equips pupils to use computational thinking and creativity to understand and change the world. Computing has deep links with mathematics, science and design and technology, and provides insights into both natural and artificial systems. The core of computing is computer science, in which pupils are taught the principles of information and computation, how digital systems work and how to put this knowledge to use through programming. Building on this knowledge and understanding, pupils are equipped to use information technology to create programs, systems and a range of content. Computing also ensures that pupils become digitally literate – able to use, and express themselves and develop their ideas through, information and communication technology – at a level suitable for the future workplace and as active participants in a digital world

Aims

The national curriculum for computing aims to ensure that all pupils:

- *can understand and apply the fundamental principles and concepts of computer science, including abstraction, logic, algorithms and data representation*
- *can analyse problems in computational terms, and have repeated practical experience of writing computer programs in order to solve such problems*
- *can evaluate and apply information technology, including new or unfamiliar technologies, analytically to solve problems*
- *are responsible, competent, confident and creative users of information and communication technology*

(National Curriculum)

Computing at St Helena's

The Computing curriculum is split into three core elements: Digital Literacy, Information Technology and Computer Science. Across their time at St Helena's, the children explore these foundations in each Key Stage, preparing them for KS3 and the digital world beyond.

Digital Literacy is taught through the National Online Safety resource, which covers the eight elements of online safety, annually. These lessons combine with the PSHE digital literacy objectives and expectations for cross-curricular discussion and coverage. It is further explored in explicit technology-based units from Purple Mash in KS1 and UKS2.

Information Technology enables and encourages children to creatively apply their computing skills to a range of software and programmes for a variety of audiences and purposes. Children all have their own logins for Purple Mash, where teachers can support the children with saving and retrieving their work in an appropriate way, from Y1-6. Practical skills are built and progressed across KS1 and 2 through a bi-annual unit of work exploring spreadsheets (with statistical science and maths cross-curricular learning). In KS1 and LKS2, the children explore a music-based, cross-curricular unit of work, where they explore digital music production and sound design. In LKS2 and UKS2, there are bi-annual units (with progression of expectations and applications) of work exploring the use of databases. Finally, across all years, the children creatively use art/design software, for a variety of purposes (including digital media creation, animation and games design), to promote the understanding that computing has applications in many areas of the wider world.

Computer Science is explored annually through a series of guided coding lessons from Purple Mash. In KS1, the children begin by building their understanding of what algorithms are and how to spot for errors (debugging). In Year 2, the children will be more familiar with the software and instructions and will be able to work more independently. In KS2, these skills continue to build with an increase in challenge and requirement of critical thinking. In LKS2, the children additionally complete units of work on touch typing, where they develop their physical keyboard skills, and email, where they learn about the purpose and functionality of email systems. In UKS2, the children begin to develop an understanding of computer networks.

Outside of the Curriculum

Computing has applications - beyond the parameters of the core curriculum objectives - which are prominently accessed around school. Each class has its own set of iPads which are used by the children for photographing and recording work/activities, as well as researching and using the internet. Children also have annual access to laptops where they can build their understanding of word processing and presentation software (Word and PowerPoint) for a range of purposes across other subjects. In school, we also have access to a class set of augmented-reality (AR) devices, that allow children to explore objects (such as artifacts, fossils and even human organs!) through technology.

Computing Long Term Plan

	KS1		LKS2		UKS2	
	Year A	Year B	Year A	Year B	Year A	Year B
Half Term 1	Unit 1.4: Lego Builders. 3 x Lessons. Unit 1.8: Spread Sheets. 3 x Lessons.	Unit 1.6: Animated Stories. 5 x Lessons	Unit 3.3: Spreadsheets: 3 x Lessons Unit 3.6 Branching Databases: 3x Lessons	Unit 3.4: Typing: 4x Lessons Unit 4.6: Animation 3 x Lessons	Unit 4.7 Effective Searching: 3 x Lessons Unit 5.4: Databases 3 x Lessons	Unit 5.3: 3D Modelling: 4 x Lessons Unit 6.6: Networks: 3 x Lessons
Half Term 2	Unit 2.7: Making Music. 3 Lessons Unit 1.9: Tech Outside School. 2 x lessons.	Unit 2.6: Creating Pictures. 5 x lessons.	Unit 3.5: Email: 6 x Lessons	Unit 4.9: Making Music 4 x Lessons	Unit 5.5: Game Creator 5 x Lessons	Unit 5.3 Spreadsheets: 5 x Lessons
Half Term 3	Using technology to support learning in foundation subjects.	Unit 1.7 Coding (6 lessons).	Using technology to support learning in foundation subjects.	Unit 2.1 Coding (6 lessons).	Using technology to support learning in foundation subjects.	Unit 3.1 Coding (6 lessons)
Total	17 lessons. + 8 x NOS lessons (combined PSHE)	16 lessons +8x NOS lessons (combined PSHE)	17 lessons +8x NOS lessons (combined PSHE)	16 lessons +8x NOS lessons (combined PSHE)	16 lessons +8x NOS lessons (combined PSHE)	17 lessons +8x NOS lessons (combined PSHE)

Computing Progression of Skills

Computer Science

Curriculum Statement	KS1	Curriculum Statement	LKS2	UKS2
Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions	Children can explain that an algorithm is a set of instructions to complete a task. When designing simple programs, children show an awareness of the need to be precise with their algorithms so that they can be successfully converted into code.	**Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts.**	Children can turn a simple real-life situation into an algorithm for a program by deconstructing it into manageable parts. Their design shows that they are thinking of the desired task and how this translates into code. Children can identify an error within their program that prevents it following the desired algorithm and then fix it.	Children may attempt to turn more complex real-life situations into algorithms for a program by deconstructing it into manageable parts. Children are able to test and debug their programs as they go and can use logical methods to identify the approximate cause of any bug but may need some support identifying the specific line of code.
Create and debug simple programmes.	Children can create a simple program that achieves a specific purpose. They can also identify and correct some errors, e.g. Debug Challenges: Chimp. Children's program designs display a growing awareness of the need for logical, programmable steps	**Use sequence, selection and repetition in programs; work with variables and various forms of input and output.**	Children demonstrate the ability to design and code a program that follows a simple sequence. They experiment with timers to achieve repetition effects in their programs. Children are beginning to understand the difference in the effect of using a timer command rather than a repeat command when creating repetition effects. Children understand how variables can be used to store information while a program is executing.	Children can translate algorithms that include sequence, selection and repetition into code with increasing ease and their own designs show that they are thinking of how to accomplish the set task in code utilising such structures. They are combining sequence, selection and repetition with other coding structures to achieve their algorithm design
Use logical reasoning to predict the behaviour of simple programs.	Children can identify the parts of a program that respond to specific events and initiate	**Use logical reasoning to explain how some simple algorithms work and to**	Children's designs for their programs show that they are thinking of the structure of a	When children code, they are beginning to think about their code structure in terms of the

	specific actions. For example, they can write a cause and effect sentence of what will happen in a program.	*detect and correct errors in algorithms and programs*	program in logical, achievable steps and absorbing some new knowledge of coding structures. For example, 'if' statements, repetition and variables. They make good attempts to 'step through' more complex code in order to identify errors in algorithms and can correct this. e.g. traffic light algorithm in 2Code. In programs such as Logo, they can 'read' programs with several steps and predict the outcome accurately.	ability to debug and interpret the code later, e.g. the use of tabs to organise code and the naming of variables.
		Understand computer networks, including the internet; how they can provide multiple services, such as the World Wide Web, and the opportunities they offer for communication and collaboration.	Children can list a range of ways that the internet can be used to provide different methods of communication. They can use some of these methods of communication, e.g. being able to open, respond to and attach files to emails using 2Email. They can describe appropriate email conventions when communicating in this way.	Children understand the value of computer networks but are also aware of the main dangers. They recognise what personal information is and can explain how this can be kept safe. Children can select the most appropriate form of online communications contingent on audience and digital content, 2Email, Display Boards.

Information Technology

Curriculum Statement	KS1	Curriculum Statement	LKS2	UKS2
Use technology purposefully to create, organise, store, manipulate and retrieve digital content.	Children demonstrate an ability to organise data using, for example, a database such as 2Invesitigate and can retrieve specific data for conducting simple searches. Children are able to edit more complex digital data. Children are confident when creating, naming, saving and retrieving content. Children use a range of media in their digital content including photos, text and sound.	**Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content.**	Children understand the function, features and layout of a search engine. They can appraise selected webpages for credibility and information at a basic level. .	Children search with greater complexity for digital content when using a search engine. They are able to explain in some detail how credible a webpage is and the information it contains.
		Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information.	Children are able to make improvements to digital solutions based on feedback. Children make informed software choices when presenting information and data. They create linked content using a range of software such as 2Connect and 2Publish+. Children share digital content within their community, i.e. using Virtual Display Boards.	Children are able to make appropriate improvements to digital solutions based on feedback received and can confidently comment on the success of the solution. e.g. creating their own program to meet a design brief using 2Code. They objectively review solutions from others. Children are able to collaboratively create content and solutions using digital features within software such as collaborative mode. They are able to use several ways of sharing digital content.

Digital Literacy

Curriculum Statement	KS1	Curriculum Statement	LKS2	UKS2
Recognise common uses of information technology beyond school.	Children understand what is meant by technology and can identify a variety of examples both in and out of school. They can make a distinction between objects that use modern technology and those that do not e.g. a microwave vs. a chair.	*Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concern about content and contact.*	Children demonstrate the importance of having a secure password and not sharing this with anyone else. Furthermore, children can explain the negative implications of failure to keep passwords safe and secure. They understand the importance of staying safe and the importance of their conduct when using familiar communication tools such as 2Email in Purple Mash. They know more than one way to report unacceptable content and contact.	Children have a secure knowledge of common online safety rules and can apply this by demonstrating the safe and respectful use of a few different technologies and online services. Children implicitly relate appropriate online behaviour to their right to personal privacy and mental wellbeing of themselves and others.
Use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies.	Children understand the importance of keeping information, such as their usernames and passwords, private and actively demonstrate this in lessons. Children take ownership of their work and save this in their own private space such as their My Work folder on Purple Mash			